

CLAIM AMENDMENTS

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1. (Original) A pyrophosphoric acid bath for use in cyanogen-free copper-tin alloy plating, characterized by containing an additive (A) composed of an amine derivative, an epihalohydrin and a glycidyl ether compound.

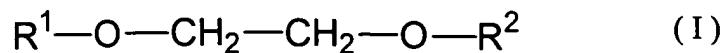
2. (Original) A pyrophosphoric acid bath for use in cyanogen-free copper-tin alloy plating according to claim 1, wherein the amine derivative comprises one member, or two or more members selected from the group consisting of ammonia, ethylenediamine, diethylenetriamine, piperazine, n-propylamine, 1,2-propanediamine, 1,3-propanediamine, 1-(2-aminoethyl)piperazine, 3-diethylaminopropylamine, dimethylamine, hexamethylenetetramine, tetraethylenepentamine, triethanolamine, hexamethylenediamine and isopropanolamine.

3. (Original) A pyrophosphoric acid bath for use in cyanogen-free copper-tin alloy plating according to claim 1, wherein the amine derivative is piperazine or 1-(2-aminoethyl)piperazine.

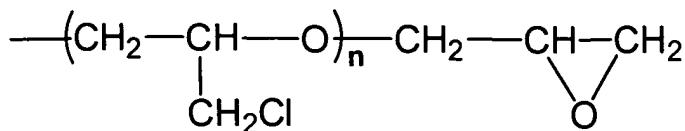
4. (Original) A pyrophosphoric acid bath for use in cyanogen-free copper-tin alloy plating according to claim 1, wherein ratios of the epihalohydrin and of the glycidyl ether compound in the additive (A) are 0.5 mol to 2 mol of the epihalohydrin and 0.1 mol to 5 mol of the glycidyl ether compound, respectively, per 1 mol of the amine derivative.

5. (Currently Amended) A pyrophosphoric acid bath for use in cyanogen-free copper-tin alloy plating according to claim 1 ~~or 4~~, wherein the glycidyl ether compound in the additive (A) is a polyfunctional glycidyl ether compound having two or more functional groups in the molecule.

6. (Currently Amended) A pyrophosphoric acid bath for use in cyanogen-free copper-tin alloy plating according to claims 1 ~~or 4~~, wherein the glycidyl ether compound in the additive (A) is a polyglycidyl ether of an adduct of ethylene glycol added with 0 to 2 mol epichlorohydrin, represented by general formula (I)



(wherein R¹ and R², which may be the same or different, each represent a group represented by the following formula



and n is 0 or 1).

7. (Original) A pyrophosphoric acid bath for use in cyanogen-free copper-tin alloy plating according to claim 1, further comprising an additive (B) composed of an organic sulfonic acid and/or an organic sulfonic acid salt.

8. (Currently Amended) A pyrophosphoric acid bath for use in cyanogen-free copper-tin alloy plating according to claim 1 any one of claims 1 to 7, wherein the plating bath has a pH of 3 to 9.

9. (Currently Amended) A copper-tin alloy coating which can be obtained by using ~~the~~ ~~a~~ pyrophosphoric acid bath for use in cyanogen-free copper-tin alloy plating, characterized by containing an additive (A) composed of an amine derivative, an epihalohydrin and a glycidyl ether compound ~~described in any one of claims 1 to 8 above~~.

10. (New) The copper-tin alloy coating according to claim 9, wherein the amine derivative comprises one member, or two or more members selected from the group consisting of ammonia, ethylenediamine, diethylenetriamine, piperazine, n-propylamine, 1,2-propanediamine, 1,3-propanediamine, 1-(2-aminoethyl)piperazine, 3-diethylaminopropylamine, dimethylamine,

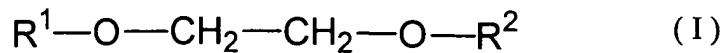
hexamethylenetetramine, tetraethylenepentamine, triethanolamine, hexamethylenediamine and isopropanolamine.

11. (New) The copper-tin alloy coating according to claim 9, wherein the amine derivative is piperazine or 1-(2-aminoethyl)piperazine.

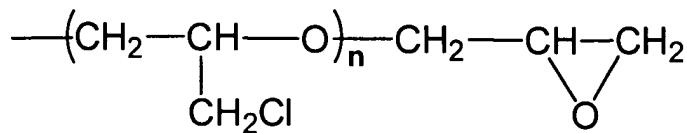
12. (New) The copper-tin alloy coating according to claim 9, wherein ratios of the epihalohydrin and of the glycidyl ether compound in the additive (A) are 0.5 mol to 2 mol of the epihalohydrin and 0.1 mol to 5 mol of the glycidyl ether compound, respectively, per 1 mol of the amine derivative.

13. (New) The copper-tin alloy coating according to claim 9, wherein the glycidyl ether compound in the additive (A) is a polyfunctional glycidyl ether compound having two or more functional groups in the molecule.

14. (New) The copper-tin alloy coating according to claim 9, wherein the glycidyl ether compound in the additive (A) is a polyglycidyl ether of an adduct of ethylene glycol added with 0 to 2 mol epichlorohydrin, represented by general formula (I)



(wherein R¹ and R², which may be the same or different, each represent a group represented by the following formula



and n is 0 or 1).

15. (New) The copper-tin alloy coating according to claim 9, wherein the pyrophosphoric acid bath further comprises an additive (B) composed of an organic sulfonic acid and/or an organic sulfonic acid salt.

16. (New) The copper-tin alloy coating according to claim 9, wherein the plating bath has a pH of 3 to 9.